



### **M**EMORANDUM

**To:** Sean Sheldrake, U.S. Environmental Protection **Date:** December 23, 2013

Agency

From: Ryan Barth, P.E., Anchor QEA, LLC Project: 000029-02.25

Joy Dunay, Anchor QEA, LLC

**Cc:** Robert Wyatt, NW Natural

Patty Dost, Pearl Legal Group Carl Stivers, Anchor QEA, LLC

**Re:** Data Report for EPA-required NW Natural Sediment Characterization Adjacent to

U.S. Moorings Site – Addendum 1 to the Project Area Identification Report Quality

Assurance Project Plan

This memorandum provides a summary of the U.S. Environmental Protection Agency (EPA)-required sediment characterization adjacent to the U.S. Government Moorings (U.S. Moorings) Site and Gasco Sediments Site. This characterization was conducted by NW Natural as required by EPA to support investigations regarding the potential presence of substantial product as defined in Remedial Action Objective (RAO) 1 of the Gasco Sediment Site Statement of Work (SOW; EPA 2009) attached to the Administrative Settlement Agreement and Order on Consent for Removal Action (Consent Order; CERCLA Docket No. 10-2009-0255) . The characterization was conducted in accordance with the *Project Area Identification Report Quality Assurance Project Plan Addendum 1 – Study Design Sediment Characterization Adjacent to U.S. Moorings Site Required by EPA* (QAPP Addendum 1; Anchor QEA 2013) with the incorporated revisions discussed in the EPA study design review letter dated August 15, 2013, NW Natural's response letter dated September 5, 2013, and EPA's response to NW Natural's response letter dated September 9, 2013.

### **BACKGROUND**

EPA required NW Natural to conduct subsurface sediment sampling adjacent to the U.S. Moorings Site and Gasco Sediments Site to confirm or refute the presence of substantial product at five locations, where EPA indicated the sediment descriptions in historical core logs were inconclusive. A detailed regulatory background is provided in QAPP Addendum 1 (Anchor QEA 2013). Prior to sampling, Anchor QEA held a workshop on October 9, 2013 with EPA's oversight consultant (CDM Smith) to review the following project-specific definition of

substantial product as identified in the SOW and application of this definition to sediments to be collected during the sediment characterization:

Section 3.6.2.1 of the SOW defines "substantial presence of product" as those sediments that meet the following specific visual criteria:

- "Criterion 1: Bands of product, layers of product, "saturated" sediments, "stained" sediments, and/or seams of product that are greater than 2 inches.
- *Criterion 2:* Any layer or seam of product, regardless of thickness, that is clearly defined as liquid dense non-aqueous phase liquid (DNAPL) that is also mobile (i.e., "oozes" or "drips" out of the core during core observations).

Section 3.6.2.1 of the SOW also identifies the following modifying factors to these criteria:

- If the top 5 feet of a core has no substantial product under Criterion 1, then deeper product should be judged as "not substantial," even if relatively thick layers of product exist at greater depths. An additional Criterion 3 will consider whether the 5 feet of overlying relatively clean material includes any sediment that would be expected to be removed as part of USACE maintenance dredging in the navigation channel. If so, the 5-foot depth requirement should be judged from the depth to which maintenance dredging would occur.
- If there are any seams of mobile liquid DNAPL (not solid or semisolid tar) per Criterion 2, then this is substantial product regardless of depth and the characteristics of overlying sediments.

### FIELD EVENT SUMMARY

Five cores were collected on October 28, 2013 and November 1, 2013 for visual observations and sample archival at the following stations shown on Figure 1: 20-BFAQ, 50-BGAQ, C528AQ, GS-01AQ, and SDDA18AQ. Cores were collected, visually logged, and processed by Anchor QEA staff in accordance with QAPP Addendum 1 (Anchor QEA 2013) with the exception of the deviations required at station GS-01AQ as described in two field change request forms (Attachment 1). Cores at stations 20-BFAQ, 50-BGAQ, C528AQ, and SDDA18AQ were collected using a 3.75-inch-diameter and 15-foot-long decontaminated aluminum core tube barrel driven by a hydraulic vibracorer collected aboard the Marine Sampling Systems research vessel Nancy Anne on October 28, 2013. Cores were driven down to the target depth (14 feet), or until refusal, and then winched up onto the vessel. The percent recovery of each core was calculated based on the recovered length of sediment and the penetration depth. Sediment core tubes were cut into 4-foot sections and transported upright to the processing facility on the NW

Natural Gasco property. All cores were stored upright on ice and processed within 24 hours of collection.

The sampling vessel could not reach location GS-01AQ because the river was too shallow here to allow vessel access. As described in detail in the field change request forms (Attachment 1), location GS-01AQ was collected from the landside, during low-tide, on November 1, 2013 by Anchor QEA staff using a hand-driven piston corer with a 3-inch-diameter and 4-foot-long decontaminated polycarbonate core tube. The sediment surrounding the driven core tube was excavated to remove the core tube without losing the sediment. Excavated sediments and sidewalls were observed for the presence of substantial product during the core removal. The recovered core and excavated sediments were immediately transferred to the processing facility on the upland NW Natural Gasco property.

In accordance with the EPA–approved QAPP Addendum, targeted sample intervals were collected from the recovered depth in each core, homogenized using decontaminated stainless steel equipment, placed in certified sample containers, packed in a cooler with ice, and delivered to Analytical Resources Incorporated (ARI) laboratory to be stored in frozen archive for potential future analysis. Field quality control samples included an equipment field wipe and field duplicate. Table 1 presents a summary of the field data and samples collected from each core. Attachment 2 contains the field forms including daily logs, health and safety briefings, air monitoring logs, core collection forms, and core processing forms. Attachment 3 contains the sample chain-of-custody forms.

#### CORE PROCESSING OBSERVATIONS AND CONCLUSIONS

Core processing was observed by EPA's oversight consultant (Jeanette Mullin from CDM Smith) and U.S. Army Corp of Engineers (USACE) representatives (Sharon Gelinas, Mike Gross, and Christine Budai). After each core segment was opened, a MultiRae Plus photoionization detector (PID) was scanned across the entire length of the core. There were no organic vapor readings above zero. Next, the undisturbed core segments were placed together alongside two measuring tapes (engineers and metric) and photographed (Attachment 4). Areas with potentially impacted sediment were more thoroughly investigated (i.e. sheens, hydrocarbon odors, and thickness) by all observers to determine the presence or absence of substantial product using the project-specific definition of substantial product. EPA's oversight consultant and Anchor QEA agreed that no substantial product was present at any of the five core stations.

### **REFERENCES**

Anchor QEA, 2013. Study Design for Sediment Characterization Adjacent to U.S. Moorings Site

Required by EPA – Addendum 1 to the Project Area Identification Report Quality Assurance

Project Plan. Prepared by Anchor QEA for NW Natural. July 2013.

EPA (U.S. Environmental Protection Agency), 2009. *Statement of Work – Gasco Sediments Site, Portland Harbor Superfund Site, Portland, Oregon.* September 2009.

### **TABLES**

### Table 1 Core Collection Summary

Location ID	X coordinates <sup>1</sup>	Y Coordinates <sup>1</sup>	Elevation in feet (NAVD88)	Elevation in feet (CRD)	Penetration Depth (ft)		Percent Recovery	U.S. Moorings Maintanance Dredge Area	Maintanance Dredge Depth in feet (CRD) <sup>2</sup>	Substantial Product Found?	Sample Archives	Sample Start Depth (ft)	Sample End Depth (ft)
											20-BFAQ-0-1-131029	0	1
											20-BFAQ-1-4-131029	1	4
20-BFAQ	7622898.985	706325.9055	-8.26	-13.26	14	13.5	96%	В	-24	No	20-BFAQ-4-8-131029	4	8
											20-BFAQ-8-12-131029	8	12
											20-BFAQ-12-13.15-131029	12	13.15
											50-BGAQ-0-1-131029	0	1
							101%			No	50-BGAQ-1-4-131029	1	4
50-BGAQ	7623184.525	84.525 706142.7648	1.82	-3.18	14	14.1					50-BGAQ-4-8-131029	4	8
50-BGAQ	7023104.323										50-BGAQ-8-12-131029	8	12
											50-BGAQ-8-12-131029DUP	8	12
											50-BGAQ-12-13.6-131029	12	13.6
											C528AQ-0-1-131028	0	1
C528AQ	7622847.881	706185.5075	-6.76	-11.76	13	9.2	71%	В	-24	No	C528AQ-1-4-131028	1	4
CSZOAQ	1022041.001	700165.5075	-0.70	-11.76	13	9.2	7 1 70	В	-24	NO	C528AQ-4-8-131028	4	8
											C528AQ-8-9.3-131028	8	9.3
GS-01AQ	7623087.111	706049.8656	-1.75	-6.75	3.5	2.5	100%/0% <sup>3</sup>			No	GS-01AQ-0-1-131101	0.8	1
GG-01AQ	7023007.111	700049.0030	-1.75	-0.73	5.5	2.5	100%/0%			110	GS-01AQ-1-1.65-131101	1	2.5
											SDDA18AQ-0-1-131028	0	1
											SDDA18AQ-1-4-131028	1	4
SDDA18AQ	7623005.756	706324.6172	-16.76	-21.76	14	12.5	89%		20	-36 I N∩	SDDA18AQ-54-55-131028	4.5	4.58
SDDATOAQ	7023003.730	700324.0172	12 -10.76 -2	-21.70	14	12.5	0370	A	-30		SDDA18AQ-55-56-131028	4.6	4.67
									SDDA18AQ-4-8-131028	4	8		
											SDDA18AQ-8-12.35-131028	8	12.35
Field QC											EB-131029		

Notes:

NAVD88 = North American Vertical Datum of 1988

CRD = Columbia River Datum

ft = feet

QC = quality control

<sup>&</sup>lt;sup>1</sup> Coordinates are provided in northing and easting in North American Datum 1983 (NAD83) State Plane North, International Feet

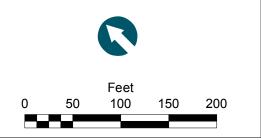
 $<sup>^{\</sup>rm 2}$  Assumed dredge depths are based on the USACE letter dated July 27, 2012

<sup>&</sup>lt;sup>3</sup> The top 0.8 ft of cobble was removed prior to coring. 0.8-2.5ft was believed to be fully recovered. 2.5-3.5 was believed to yield no recovery (hit large cobble as observed by damage to the bottom of the core tube upon core retrieval).

### **FIGURES**



Core LocationNavigation Channel



# ATTACHMENT 1 FIELD CHANGE REQUEST FORMS

Project Name:	Gasco Sediments Cleanup	o Action	Subconsu	ultant:	Anchor QEA			
Field Activity:	Activity: Sediment Core Collection		Request Number:		1			
To: Sean She	eldrake, EPA		Date:	October	31, 2013			
Field Change Request (FC	R) Title: Rev	vised Core	Collection	n Method -	Insufficient Water Depth			
Description: NW Na	atural attempted to collect	t a single c	ore from	each of the	e five target stations identified			
n the EPA-approved Study Design for Sediment Characterization Adjacent to U.S. Moorings Site Required by EPA								
– Addendum 1 to the Proje	ect Area Identification Rep	ort Quality	/ Assurano	ce Plan, dat	ted July 18, 2013. The river			
water surface elevations v	water surface elevations were too shallow to facilitate core collection from a vessel at station GS-01.							
Recommended Change:	NW Natural proposes	collection	of the co	re at statio	n GS-01 using a hand-driven			
core, accessed by personn	core, accessed by personnel from the landside. The core will either be a 2-inch or 3-inch decontaminated,							
Polycarbonate tube that is 3 to 4 feet in length, respectively. The diameter size will be selected based on the								
nature of the encountered	d materials. Anchor QEA p	roposes co	ollection a	at the targe	et location on Friday November			
1, 2013 between 12 and 1	pm during the low tide. C	DM Smith	and USAC	CE personn	el will be present during			
collection. Anchor QEA ar	nd CDM Smith personnel w	vill perforn	n the core	processing	g at an upland core processing			
area immediately followin	g core collection to visuall	ly evaluate	the prese	ence of sub	estantial product in the upper			
0 to 2 foot interval. USAC	E personnel will be provide	ed access t	to observe	e the core <sub>l</sub>	processing activities per EPA's			
request.								
Joy Dunay		Joyeu	Dura	T	October 31, 2013			
Respondent Field Coordin	nator (or Designee)	Signatur			Date			
Approval:								
Ryan Barth		Ryan	n Bai	4	October 31, 2013			
Respondent Project Lead		Signature	<u></u>		Date			
		J						
Distribution List:								
Sean Sheldrake, EPA Sheldrake.Sean@epamail.e	<u>pa.gov</u> ; 206-553-1220		es Peale, M <u>e@maulfo</u>		503-501-5218			

Carl Stivers, Anchor QEA

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Alan Gladstone, Davis Rothwell Earle and Xochihua agladstone@davisrothwell.com; 503-222-4422

Project Name:	Gasco Sediments Clea	nup Action Subconsu	ıltant:	Anchor QEA	
Field Activity:	Sediment Core Collect	cion Request I	Number:	2	
То:	Sean Sheldrake, EPA	Date:	Novembe	er 5, 2013	
Field Change Rec	juest (FCR) Title:	Revised Core Collection	Method A	Amended Approach	
Description:	As discussed in Field Change	Request Form #1 dated	October 3	1, 2013, NW Natural proposed	
the collection of	a single hand-driven core at stat	cion GS-01 accessed from	n the land	side. Anchor QEA, CDM	
Smith, and USAC	E personnel accessed the station	n from the landside on N	November	1, 2013. The subsurface	
substrate preven	ted the collection of a core to th	ne target 3 feet below g	round surf	ace so Anchor QEA contacted	
EPA to propose a	revised sampling approach. EP	A agreed with the revise	ed approac	ch (described below) and	
provided verbal a	approval to proceed. The revise	d approach achieved th	e visual ob	oservations to the target	
depth.					
Recommended C	hange: Station GS-01 cont	ained 10-inch cobble at	the groun	d surface so Anchor QEA	
field personnel re	emoved the cobble to expose th	e underlying sandy surf	ace. Anch	or QEA attempted to hand	
drive a decontam	ninated 3-foot polycarbonate co	re tube to 3 feet below	ground sui	rface (2 feet 2 inches	
below sandy surf	ace – accounts for removal of th	ne overlying 10-inch laye	er of cobbl	e). Several attempts were	
made to reach th	is target depth without success	due to rocky substrate	below the	sand layer. The deepest core	
penetration was	3 feet 6 inches. Upon recovery	of the core, only 1 foot	8 inches of	material was recovered.	
Therefore, Ancho	or QEA contacted EPA to describ	e the recovery issue and	d propose	a revised sampling approach	
that would allow	visual observations of the rema	ining 6 inches below the	e core reco	overy depth. This approach	
included digging	using a hand shovel and visually	logging the mixed mate	erials in co	ordination with CDM Smith.	
EPA approved thi	s approach by telephone. Anch	or QEA dug a hole to 3	feet below	the cobble surface and placed	
materials in buck	ets. Anchor QEA and CDM Smit	h logged the materials o	captured in	the core tube and visually	
logged the mixed material in the buckets. No material was identified that achieved the definition of substantial					
product so this station was designated as containing no substantial product.					
		Vacua Duna	1		
Joy Dunay		Joyeu Duvar	0	November 5, 2013	
Respondent Field	d Coordinator (or Designee)	Signature		Date	
Approval:					
		Ryan Baut	t		
Ryan Barth				November 5, 2013	
Respondent Proj	ect Lead	Signature		Date	

#### **Distribution List:**

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### ATTACHMENT 2 FIELD FORMS

### **Daily Log**



Anchor QEA, L.L.C.

720 Olive Way, Suite 1900

Seattle, WA 98101

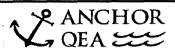
Phone 206.287.9130 Fax 206.287.9131

	Thore 200,207,7150
PROJECT NAME:	: Gasco Site Remedy U.S. Moorings  DATE: 10/28/2017
SITE ADDRESS:	PERSONNEL: Joy, Even, Ryan, Kora, Das, Ma
WEATHER:	WIND FROM: N NE E SE S SW W NW LIGHT MEDIUM HEAVY SUNNY CLOUDY RAIN ? TEMPERATURE: °F 50 . °C [Circle appropriate units]
TIME	COMMENTS
6700	Arrived on -site at NW Natural (Aastaff)
07.15	Shawn olivers from com smith arrived
0860	H+S Kick-off
8:30	Satur work Zones
11300	Jeanethe rullin from Com Smith arrived
1200	Ryan arrived with SDDA-18 and C528-AP
12:3=	USACK Sharon, Mike, Chris, Paul arrival
1245	Has briefing with new steff
1300	opened SODAIS-AQ
i455	penel C528AQ
1555	Fin short procession
1600	Cleanup,
	A
	D2 10/28/13
<u> </u>	
l	

Signature

John Dun

### **Daily Log**



Anchor QEA, L.L.C. 720 Olive Way, Suite 1900 Seattle, WA 98101

Phone 206.287.9130 Fax 206.287.9131

	Thore 200,207,7150 Tax 200,207,7151
PROJECT NAME:	Gasco Site Remedy U.S. Moorings DATE: 10/28/13
SITE ADDRESS:	PERSONNEL: Kiva Hitchto, RB, MW,
WEATHER:	WIND FROM: N NE E SE S SW W NW LIGHT MEDIUM HEAVY SUNNY CLOUDY RAIN ? TEMPERATURE: CF SS . °C [Circle appropriate units]
TIME	COMMENTS
0700	Anchor QEA staff orive au-Sibe
0730	GBCDM Staff (seem) curves on-site
08:30	Arrive at boat doct, load boat
09:41	Collected SDDA-18-AQ first altempt
10:51	Collected CS28-AQ First attempt
11:50	Returned to boost dock to drop off coves Ryan and Sean
11250	left to go oversee processing
12:22	Collected 20-BF-10 first attempt
13:51	Callested 50-BG-AQ first attempt
14:00	Writed at 50-136-AQ for direction regarding 65-01-AQ
<u>)</u>	round not get an-site live to water depth
(5:00	Arrived back at doct, did not collect GS-01-AQ
15:20	Arrived back at Gasco facility for rave-processing.
	Unloaded wes.
	A second
	A26/2/13
	~
-	
11	

### **Daily Log**



Anchor QEA, L.L.C. 720 Olive Way, Suite 1900

Seattle, WA 98101

Phone 206.287.9130 Fax 206.287.9131

	11.01.0 200.01.7100 1tt 400.001.7101						
PROJECT NAME:	Gasco Site Remedy U.S. Moorings DATE: 10/24/2013						
SITE ADDRESS:	PERSONNEL: Joy, Ryan, Kara, Evan						
WEATHER:	WIND FROM: N NE E SE S SW W NW LIGHT MEDIUM HEAVY SUNNY CLOUDY RAIN ? TEMPERATURE: °F 55 . °C [Circle appropriate units]						
TIME	COMMENTS						
0745	Arrive on site						
-0815	SUSACE arrived on site muphs						
0815	Jeanette Mulin (com smith) arrived on site usAct arrived on site (sharon; mike)						
0830	USACE arrival or site (Sharon, Mike)						
0845	operal care 2013F_AQ						
0900							
1045	Chris B. (USACE) arrival to observe last core						
1100	Chris B. (USACE) arrival to observe last core						
1120	us ace left						
1200	Cleanup site						
1230	Collected Equipment Field wipe 41 X 41 Surface Area of Bowl + Spoon						
1445	Left SITE						
Company of the Com							
	10/29/15						
· :							
'							

Signature:



DATE: 10/28/2013

PROJECT NAME: Gasto Site US Moonings

PROJECT NO: 000029-02.25 Task 100

### **DAILY SAFETY BRIEFING**

PERSON CONDUCTING MEETING: Joy Dave Y OFFICER: Jo		nay	PROJECT MANAGER:	Rojan Barth	
TOPICS COVERED:		1			
Evacuation Route Lines of Auth	nority		Lifting Ted	chniques	
Evacuation Route  Directions to Hospital Sawar Hacer Communication  WHASP Review and Location	ion		Slips, Trip	s, and Falls	docard
HASP Review and Location Site Security			Hazard Ex	s, and Falls sposure Routes Inhalation,	contact, injest
Safety Equipment Location AED Vessel Safety	/ Proto	ocols	Heat and		
Proper Safety Equipment Use Work Zones	*	1	With the same of t	I and Underfoot Hazards	
		Driving/Road			C TPH DAY
Location Conditions	.,	onting, nead	Concinical	Hazards VOC's, Metal HZS, Solven	45
Fire Extinguisher Location Equipment S	afety a	and Operation		ie Hazaros	
Eye Wash Station Location Proper Use of	f PPE		Biological	Hazards Direct Contact	with liver
☐ Buddy System ☐ Decontamin	ation P	Procedures	☐ Eating/Dr	inking/Smoking	050
Self and Coworker Monitoring Other: AED	LOC	shows Mys/3			
		1-1			
WEATHER CONDITIONS: COOL, SURVY	_		ATTEN	DEES	
		PRINTED	NAME	SIGNATURE	
	_	T-13		7 6	
		JOY DU	my (		
DAILY WORK SCOPE: Collect 5 Core	5,	Kvan Bo	irth F	Kyrum Dent	
		11/24	100- 6	11/10/50-1	
Process 2 cores		19au a	11(500 9	Tall the	
		Dovs L	affor	to Aff	
		VI	1.1.1.1.	VI WAL	
		Nara h	11 tenco g	en Trally	5
SITE-SPECIFIC HAZARDS: VOCS, Metals	,	Evan 1	MalcryK	Un 10/1	
TPIH, PAH, H2S, solvents		Shaw	w Olivia	Millini	
, , ,		OL & R		MAIRI"	
		Chms D	ugai 1	Charles of Dedan	
		Shavon (	ochinas.	Mulh	
		Mile G FaulVan Jegnett	1045	Mue	
SAFETY COMMENTS:		Fa. 11/an	Horns	Polla 1	
SAFETT COMMENTS.		1 aurun	1 10 oct	tant Van Jone	
		Jeg nett	e Mulling	- Janett Mulh	
				0	



DATE:	10/28/13
PROJECT NAME:	Gasco US Moorings
PROJECT NO:	

### **DAILY SAFETY BRIEFING**

person conducting MEETING: Dale Dickinsi	HEALTH & SAFETY ) OFFICER:		PROJECT MANAGER	:
TOPICS COVERED:				
Emergency Procedures and	Lines of Authority		Lifting T	echniques
Evacuation Route  Directions to Hospital  HASP Review and Location  Safety Equipment Location  Proper Safety Equipment Use  Employee Right-to-Know/MSDS Location  Fire Extinguisher Location  Eye Wash Station Location  Buddy System  Self and Coworker Monitoring	Communication Site Security Vessel Safety Prot Work Zones Vehicle Safety and Conditions Equipment Safety Proper Use of PPE Decontamination Other:	d Driving/Road and Operation	Hazard Heat an Overhea Chemica Flamma Biologic	ips, and Falls Exposure Routes d Cold Stress ad and Underfoot Hazards al Hazards able Hazards al Hazards al Hazards cal Hazards
WEATHER CONDITIONS: 5	1 clear,		ATTE	NDEES
hraza.	J ,	PRINTE	NAME	SIGNATURE
-1,000		Karal-	hitcheo	16 Hth
Cores	S sediment	Dale Die Shawn	Oliveira Oliveira	Shalling Wall
SITE-SPECIFIC HAZARDS:	head			
hazards, slips, to	os (nd			
falls				
SAFETY COMMENTS:			*	



DATE:	10/29/2013
PROJECT NAME:	Gasco Site Remedy U.S. Moonings
PROJECT NO:	000029-02.25 Task 100

### **DAILY SAFETY BRIEFING**

PERSON CONDUCTING MEETING: 504 DUWM	HEALTH & SAFETY OFFICER: Joy D	Unay	PROJECT MANAGER	: Ryan Barth	-
TOPICS COVERED:	•	l			
Emergency Procedures and Evacuation Route	Lines of Authority		Lifting T	echniques	
Directions to Hospital	Communication		Slips, Tr	ips, and Falls	
HASP Review and Location	Site Security		,	Exposure Routes	
Safety Equipment Location AD, Firsh	♥□ Vessel Safety Prot	ocols	Heat an	d Cold Stress	
Proper Safety Equipment Use	Work Zones /Tra	ining	Overhea	ad and Underfoot Hazards	
Employee Right-to-Know/MSDS Location	Vehicle Safety and	Driving/Road	Chemica	al Hazards Vocs, metal 1-25, Solve	is, Text, PAT ats
Fire Extinguisher Location	Equipment Safety		Flamma	ible Hazards	
Eye Wash Station Location	Proper Use of PPE			al Hazards CSO Pive	<sup>2</sup> A
Buddy System	Decontamination	Procedures	☐ Eating/[	Orinking/Smoking	
Self and Coworker Monitoring	Other:				
WEATHER CONDITIONS:	, SUNNY		ATTE	NDEES	
		PRINTED	NAME	SIGNATURE	
	÷.	JA Do	مدم	and	
		<del>910</del>		9/	<del>*</del>
DAILY WORK SCOPE: 400	S 2 Cores	tim Me	dery ic	My la T	
·		Miles	75065	16 Com	
		Ò	0 :	011.	
		Sharon	Gelinas	Mountly	<u>~</u> //
<u> </u>		Jeanette	Mullin	Seanch Mr	di
SITE-SPECIFIC HAZARDS:		Kara Hi	tchlo	hun Ald	
			p		-
					-
					_
SAFETY COMMENTS:					
SALETT COMMENTS.					-
					-

### DAILY AIR MONITORING RECORD

PROJECT NAME:	easco Site Remedy	U.S. Whomes DATE:	10/28/13	,
PROJECT NUMBER:	00029-02	.25 LOCATION:	Exclusion 20 ne	proce851 mg
TEMPERATURE:	SOFF.			//
conditions:	ear sway			
	0			
	na nakana na		T	

coc	Instrument	s/N	Calibration Date	Calibration Gas/Method	Calibration by
Organic vapors	MUHIRAE PLUS	NA	10/28/13	100 ppm isolautylen	e Math Wil
Particulates	_	_	-	-	_
O <sub>2</sub>	in.	_	_	_	_
Other: HCN	MultiRAE Plus	AN	10/28/13	LOGIM HCN	Matt. W
Other:				11	
Other:	Draeger				

Time	Location/Description	Organic Vapor (ppm)	O <sub>2</sub> %	CG %LEL	H <sub>2</sub> 5 Other	Other
1300	start	0.6	20.9	0	0	0
1330	process SDDAR	0.0	20.9	0	6	0
1400	ii m	0,0	20.9	0	6	
1430	W.	0.0	20,9	0	0	
1520	process 6528	0.0	20.9	0	3	0
1550	" is it	0.0	20.9	6	6	6
1620	aleeneup	2.0	20.9	0	6	0
		6				
	376	4				
	3.4					

Notes:

Completed by:

Printed Name

Signature

10-28-15 Date

### DAILY AIR MONITORING RECORD

PROJECT NA	ME: <u>U-a</u> MBER:	560 Site	29-02.1	.S. Woodings DATE: 25 LOCATI	_ <u> 0/2</u>  on:	8/13	
EMPFRATU	RE: ~ 50		,		4 11-11-11-11-11-11-11-11-11-11-11-11-11-		
ONDITIONS				· · · · · · · · · · · · · · · · · · ·			
CHUITIONS	: <u>Clea</u>	er/sinc	y				
			—— <del>111</del>				
				·			
		<del></del>				T	
(	oc.	Ins	trument	S/N	Calibration Date	Calibration Gas/Method	Calibration by
Organic vapo		<del></del>	ae Plus	NA	10/28/13		one Matt Wilso
Particulates		IIWIS	~u_ 11.03	17/1/	101 20113	ICC Shien Dogold	AN MICH CALIFOR
O <sub>2</sub>							
Other: HC	<i>'</i> N	MultiR	AE Plus	NA	10/28/13	10 ppm HCN	Math Wilson
Other:						11	
Other:		Draeger					
			Organic Vapo	1	CG		
Time	Location/De	escription	(ppm)	O <sub>2</sub> %	%LEL_	Other	Other
11:40	C528		0.0	20.9			·
12:22	20-Bf		0,0				
13.31	50 100	<u> </u>					
						·	
	<u> </u>		1		- a Al	<u> </u>	
lotes:	٨	, , 1		MUHIC PLAN	EAE Plus To	13113	. )
Monito	red am	618 mg	. Our w	1 0 0	Turord	rout sam	pue collec
The re	adings	CMCY VI	ST LXCLL	a bood	Lorganic	vapor) at a	ple coilecting part
the b	reath mg	ach 1	one on	ive over	s note.	me was 9 d asove	month
Completed b	y: as e	~== · · ·	1.	in the	11	> 10/	· · · · · ·
Lara	- Hite	NKO		un Ita	ulu	> (0/	Z8/13



### **DAILY AIR MONITORING RECORD**

PROJECT NA	ME: <u>C-as</u> MBER:	oco site	Remedy 1 29-02.	),S. Woon's' DATE: 25 LOCAT	ion: Exclu	8/13-10/2 5109 Zune	7/13 Processina
CONDITIONS	s: <u>Clea</u>	r, sw	ny				
			<i>U</i>				
				·			
		T			Calibration	Calibration	Calibration
	coc	Inst	trument	s/N	Date	Gas/Method	by
Organic vap		Multir	AE Plus	NA	10/28/13	100 ppm isobutyla	re Matt Wil
Particulates O <sub>2</sub>							
Other: Ha	N	PAPER !	A-SAME				
Other: H2		SA					
Other:		Draeger					
			Organic Vapo	or	CG	H& 5	Hen
Time	Location/De		(ppm)	O <sub>2</sub> %	%LEL	Other	Other
0900	<del> </del>		<u>ø</u>	20.9		Ø	Ø
1045	opened 50.	OBFAQ	Ø			Ø	D D
1110	PERCESSAL SC		Ø	+ 1		Ø	0
	F10000						Ψ.
						·	
Nata -	1477		·		· .		
Notes:							
Completed b	ıy:				_		
704	Dunay		4	Jozna	Din	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	pa/2013
Printed Nam	ie (		Sign	ature		) Date	<del></del>

Job: Gasco Site Remedy U.S. Moorings		Station ID: 20	)-BF-AQ	)
Job No: 000029-02.25	_	Attempt No.		
Field Staff: KH, MW	_	Date: 10/28/	/13	
Contractor: Manne Sumpling Sc	1stems	Logged By: Kou		
Vertical Datum: NAVID 84 NAVI	558	Horizontal Datum:	NAVD84	NADS'S Organ St
M 10/25/13	5		10/28/13	NAD83 Oregon St North
Field Collection Coordinates:			12-110	
Lat/Northing: 45 34, 9085	_	Long/Easting: 12	2 45.7	509
A. Water Depth	B. Water Lev	el Measurements	C. Mudline Ele	vation
DTM Depth Sounder: 14.5	Time: 12:		-8.2	6
DTM Lead Line: 16 - 1	Height: 5,7	14+2.10=7.84	t	
	Source: Cut	of fartical	Recovery Meas	urements (prior to cuts)
Core Collection Recovery Details:			†	
Core Accepted: (Yes) / No			1.5	
Core Tube Length: 15				
Drive Penetration: 14 Em 16/24	13	_	1	
Headspace Measurement: Q 5 1.	.5'	_		
Recovery Measurement: (3.5)			7	
Recovery Percentage: 96%	10/28/13	-		
Total Length of Core To Process:	13,11			
			15 13.5	
Drive Notes:		Core Tube Length		
0-7 easy (free for	11)	ore .		
1		Ŭ		
7-14 eary			_	
				Sections To Process
				A: 0-4
			,         .	B: 4-8
		0.4	+1/	C: 8-13.1
		Shoe		D:
				<u>.</u>
Core Field Observations and Description	on:	Sediment type, moisture, odor, sheen, layering, and		MAJOR modifier, other constitue matter, shells, biota
Conesive dork ara	W. HILL	host love	, , , , , , , , , , , , , , , , , , , ,	
1-4	9	7.0701		
11 0				
9-8			The same of the sa	
8-13.5: Gray Si	ity Silt	(Bottom)		
O				
Notes:				
Notes:				

ANCHOR Sedi	ment Core C		4	Page 1 of
Job: Gasco Site Remedy U.S. Mooring: Job No: 000029-02.25  Field Staff: KH, MW  Contractor: Manne Sampline. Vertical Datum: HAVDSit	At Da Systems Lo	ation ID: SO = tempt No.   ate:   O / 28 / 1   pgged By:   Kove prizontal Datum:	-10.00100	1083 Oregon. North
Field Collection Coordinates:  Lat/Northing: 45 34.879	<u></u>	ng/Easting: 12	2 45,682	8
A. Water Depth DTM Depth Sounder: DTM Lead Line: 6.5'	B. Water Level N Time: 13:5 Height: 6 22 1 Source: Cty of	<u> 1</u> 2.1= <b>8</b> 2.32	C. Mudline Elevation	
Core Collection Recovery Details: Core Accepted: Yes No Core Tube Length: 15 Drive Penetration: Headspace Measurement: O 9 fe Recovery Measurement: H, 1 Recovery Percentage: O 1% Total Length of Core To Process: H  Drive Notes:  O 14 Internettent	difficulty	Core Tube Length	15 14.1 B:	Sections To Process: 0'-4' 4-9' 9'-13-7'
Core Field Observations and Descripti	The state of the s		olor, minor modifier, MAJOR ic layer, debris, plant matter	
0-4: Dark 4-9: Dark 9-13.7: Da	gray silt gray silt de gray s	Silt		
Notes:				
0.4 removed a	h laice !	1		

ANCHOR Sediment Core	e Collection Log
Job: Gasco Site Remedy U.S. Moorings  Job No: 000029-02.25  Field Staff: RB, MW, CH  Contractor: MSS  Vertical Datum: NAVBSH NAVD SS  Field Collection Coordinates:	Station ID: C528-AQ  Attempt No.    Date: 10/28/13  Logged By: Kara Hitchko  Horizontal Datum: NAVDSU NADS3 Oregon SPNorth
Lat/Northing: 45 34,8852	Long/Easting: 122 45.7619
DTM Depth Sounder: 13 Time: 1011  DTM Lead Line: 12-91 Height: 4.0	C. Mudline Elevation  S. G. H. G. H. G. T.
Core Collection Recovery Details:  Core Accepted: Yes / No Core Tube Length: 15 12513  Drive Penetration: 13 13  Headspace Measurement: 5.8  Recovery Measurement: 9.2  Recovery Percentage: 7 17 2 2 1515  Total Length of Core To Process: 9.2  Drive Notes:	Core Tube Length
0-8 very easy 8-10 ,easy 10-13.6 Noval / very hard Top part of core was aggitated a to hard driving 1 Hit a rock at about 10 to 10.5 ft	Sections To Process:  A: 0-3  B: 3-6   Aluli   3
Core Field Observations and Description:	Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota
Sheen an deck upon cutting  0-3: loose, sourcy Silt.  3-6: an 1/4/13  6-9-4;  9.2'	New soft
Notes:  'Sheen as nater swface your 'Scratch marks on lainer 1.	care retrievel 4 ft of care tibe
· O.4' removed at base for shoe	

ANCHOR Sedin	nent Core Co	llection L	og			Page / of /	
Job: Gasco Site Remedy U.S. Moorings	Stati	on ID: GS	-01A	Q		SAX MINISTER PROPERTY.	
Job No: 000029-02.25	_	mpt No.				_	
Field Staff: John Renda, Jeff Pa		1				-	
Contractor: AQ	/	ged By: Jim	10				
Vertical Datum: NAVD88		zontal Datum:	NAD8	3 ORG	gar Stok	Plane North	
Field Collection Coordinates: Lat/Northing: 76 2 3 0 88	Long	/Easting: 7-c	6052	* Sav	ne exact l	ocation as pro- marker was cate station	reviews  Institute
A. Water Depth	B. Water Level Mea						
DTM Depth Sounder:	Time: NA			-1.75	x taken	from latest	bathymotor
DTM Lead Line:	Height: Source:				rements (prio		
Core Collection Recovery Details:			† [				
Core Accepted: Yes / No							
Core Tube Length: 4-8"							
Drive Penetration: 42"				<b>†</b>			
Headspace Measurement: 22 "							
Recovery Measurement: 20"			7				
Recovery Percentage: See drive note	es	£					
Total Length of Core To Process: 201		Due					
Total Longiti of Colo 10 1 100000.		٦	$\square$				
Drive Notes: the Care was driven easily							
hit Cobble Several feet down		1	]				
likely represents the -20'		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			Sections 1	To Process:	
						o Flocess.	
withe the rest of the dri	re pile ariving			-	A: 20"		
deeper				_	B: NA		
					C:		
					D: 1		
Core Field Observations and Description	1 1	ent type, moisture, sheen, layering, and					
Surrounding Sediments Wes	re dug out.	Visual obs	ervation	were	made		
1	, , , , , , , , , , , , , , , , , , , ,	· · · ·	vahon			sheens	
)			- 1				
11 ( 11 ( ) ( ) ( )	valed Sediment		Sheen		brerved o		
the water that titled the l	nole. Excavated	Sadiment	were	Calle	tes in.	5-gallon	
buckers and brought to	the processin	g area fe	- WI-	ther c	bservatio	ns	
	,	(4)					
N. C.							
Notes:							

Sediment Core	e Collection Log
Job: Gasco Site Remedy U.S. Moorings  Job No: 000029-02.25  Field Staff: RB, MW, KH  Contractor: MSS (1/25) 13  Vertical Datum: NAVD 84 (NAVD88)	Station ID: SDDA - 18 - AQ  Attempt No. 1  Date: 10/28/13  Logged By: 10/28/13  Horizontal Datum: 10/28/13  NAD83 Oregen SP
Field Collection Coordinates: Lat/Northing: 45 3 4. 9088	Long/Easting: 12Z 45.7259
DTM Depth Sounder: ~21 Time: 9:4 DTM Lead Line: 22.3 Height: 3.4	C. Mudline Elevation  14+2.10=5.54  Recovery Measurements (prior to cuts)
Core Collection Recovery Details:  Core Accepted: Yes No Core Tube Length: 5  Drive Penetration: 14  Headspace Measurement: 2.5  Recovery Measurement: 12.5  Recovery Percentage: 89% Emisizali3  Total Length of Core To Process: 12.1  Drive Notes:  O-14 Modesa tely lasif  Alor of bubbles observed as con	
	A: 0'-4' B: 4-8' C: 8-17.1' D:
Core Field Observations and Description:	Sediment type, moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota
0-4: Date gray sandy S 4-8: Gray Silt (701) 8-12.1: Gray Silty Sand	ilt. (TOP) (bottom)
Notes: No observable sheen on the 014' removed @ base for shoe.	water after pulling the care

#### **Sediment Core Log** Sheet 1 of 1 Location: Willamette River, Portland, OR Tube Length (ft): 15.0 Project: Gasco Site Remedy - U.S. Moorings Project #: 000029-02.25 Surface Water Elevation (NAVD88): 7.84 Penetration Depth (ft): 14.0 Client: NW Natural Water Depth (ft): 16.1 Field Recovery Length (ft): 13.5 Mudline Elevation (ft): -8.26 Collection Date: 10/28/2013 Process Date: 10/29/2013 Contractor: MSS N/LAT:706325.9055 E/LONG:7622898.985 Process Method: Cut tube Vessel: R/V Nancy Anne Horiz. Datum: NAD83 ORNH Vert. Datum: NAVD88 Sample Quality: Fair Operator: Bill Jaworski Method/Tube ID: Vibracore/3.75" Logged By: EM **Sediment Description** Estimated In-situ Elevation (NAVD88) Recovered Depth (ft) Recovered Interval Substantia Sample Archives Product Present (X Y Samples and Descriptions are in Recovered Depths. Classification Scheme: USCS -8.26 0-0.5 ft: SILT (ML). Very soft, moist, grayish brown, 95% non-plastic fines, 5% fine 20-BFAQ-0-1 sand. Contains organics (plant fibers and debris). No odor. No sheen. -9.0 0.5-2.5 ft: Soft -10.0 20-BFAQ-1-4 2.5-3.8 ft: 90% non-plastic fines, 10% fine sand. -11.0 -12.0 3.8-5.5 ft: Firm, 95% low-plasticity fines, 5% fine sand. -13.0 5.5-12.1 ft: Contains black mottling. Slight HC-like odor. -14.0 20-BFAQ-4-8 -15.0 -16.0 -17.0 -18.0 20-BFAQ-8-12 10.3 ft: 1 inch bed of increased organic content (decomposed) -19.0 11 ft: 0.25 inch band of SILT. Firm, blackish gray, 95% low-plasticity fines, 5% fine sand. Slight HC-like odor. No sheen. 11.4 ft: 0.25 inch band same as at 11.0 ft. -20.0 11.7 ft: 1 inch band same as at 11.0 ft. 12.1-13.15 ft: SANDY SILT (ML). Moist, firm, grayish brown, 60% non-plastic fines, 40% 20-BFAQ-12-13.15 -21.0 fine sand. No odor. No sheen. Partial void space from 12.1-12.6'. End of Core @ 13.15 ft. -22.0 -23.0 **%** ANCHOR Notes: 1. Attempt 1 of 1. **Calculated Recovery** 2. For sediment elevations in Columbia River datum subtract 5 ft from NAVD88 datum (e.g. -8.22 QEA SEE ft NAVD88 = -13.22 ft CRD). Recovery Length/Penetration Depth: 720 Olive Way, Suite 1900

96%

Seattle, WA 98101

206-287-9130

#### **Sediment Core Log** Sheet 1 of 2 Location: Willamette River, Portland, OR Tube Length (ft): 15.0 Project: Gasco Site Remedy - U.S. Moorings Project #: 000029-02.25 Surface Water Elevation (NAVD88): 8.32 Penetration Depth (ft): 14.0 Client: NW Natural Water Depth (ft): 6.5 Field Recovery Length (ft): 14.1 Mudline Elevation (ft): 1.82 Collection Date: 10/28/2013 Process Date: 10/29/2013 Contractor: MSS N/LAT:706142.7648 E/LONG: 7623184.525 Process Method: Cut tube Vessel: R/V Nancy Anne Horiz. Datum: NAD83 ORNH Vert. Datum: NAVD88 Sample Quality: Good Operator: Bill Jaworski Method/Tube ID: Vibracore/3.75" Logged By: EM **Sediment Description** Recovered Depth (ft) In-situ Elevation (NAVD88) Recovered Interval bstantia Product Present (V/V) Samples and Descriptions are in Recovered Depths. Classification Scheme: USCS 1.82 0-1 ft: SILT (ML). Moist, firm, grayish brown, SILT. 85% low-plasticity fines, 15% fine 50-BGAO-0-1 sand. Contains small organic fibers and black mottling. 1.0 1-2.5 ft: 95% low-plasticity fines, 5% fine sand. 1.7 ft (20 inches): 0.25 inch band, black, contains wood fragments. Slight H2S-like 0.0 odor, slight HC-like odor. 2-2.5 ft: Layer of increased organics (wood fragments and fibers). 60% organics, 20% 50-BGAQ-1-4 fines, 20% fine sand. Slight H2S-like odor, slight HC-like odor. -1.0 2.5-8.5 ft: 90% low-plasticity fines, 10% fine sand. Slight HC-like odor. Contains organics (wood fibers) and black mottling. 3.4 ft (41 inches): 0.4 inch black band. -2.0 3.5 ft (42 inches): 0.4 inch black band. 3.8 ft (46 inches): 0.4 inch black band. 3.9 ft: 0.4 inch band of increased organic content. 4.2 ft: 0.2 inch black band. -3.0 5 ft: 0.2 inch black band 5.75-6 ft (69-72 inches): 3 inch band. Firm, moist, black. Slight metallic sheen. Strong -4.0 HC-like odor. Contains organics (wood fibers). 50-BGAQ-4-8 -5.0 Ν 7.5-7.7 ft (90-92.5"): Black band. Slight HC-like odor. No sheen. -6.0 7.8-8 ft (93.5-96 inches): 2.5 inch band same as above at 5.75 ft. 8.2-8.35 ft (98.5-100 inches): Layer of SANDY SILT. 60% fines, 40% fine sand. Strong HC-like odor. Slight metallic sheen. Contains organics (wood fibers) 8.5-11.1 ft: Moist, firm. 100% low-medium plasticity fines. Slight HC-like odor. -7.0 Contains organics (fibers) 8.8-8.9 ft (105.5-107 inches): 1.5 inch black band. Slight HC-like odor. No sheen. 9 ft (107.5 inches): 0.25 inch black band. SILT with decomposed organics. Strong HC--8.0 like odor. Slight metallic sheen. 50-BGAQ-8-12 10.2 ft (122-124.5 inches): 2.5 inch black band. Contains increased organics (wood fragments up to 1.5 inch). Strong HC-like odor. Slight metallic sheen. 10.95 ft (131 inches): 0.5 inch blank band. Strong HC-like odor. No sheen. -9 N 11.1-11.5 ft: SANDY SILT (ML). Moist, firm, grayish brown, 60% low-plasticity fines, 40% fine sand. Slight HC-like odor. Contains organics. . 11.5-13.4 ft: SILT (ML). Moist, firm, grayish brown, 90% low-medium plasticity fines, 10% fine sand. 12.1 ft (145 inches): 0.25 inch black band. Strong HC-like odor. Slight metallic sheen. -11 0 50-BGAQ-12-13.9 12.75 ft (151.5 inches): 0.25 inch band same as above at 12.1 ft. 12.9 ft (154.5-156 inches): 1.5 inch band same as above at 12.1 ft. 13.2-13.4 ft (158.5, 159, and 160 inches): Three 0.1 inch black bands. No sheen. -12.0 13.4-13.7 ft: Organics content increases downcore (wood and root-like fibers). Slight HC-like odor. No sheen. 13.6 ft (163-134 inches): 0.5 inch black band. Strong HC-like odor. No sheen. -13.0& ANCHOR Notes: 1, Attempt 1 of 1,

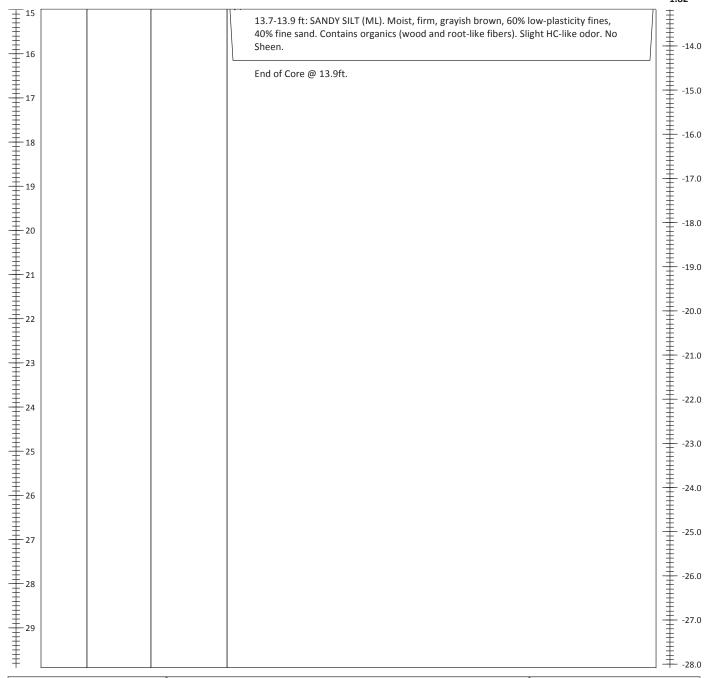
QEA SE 720 Olive Way, Suite 1900 Seattle, WA 98101 206-287-9130

2. For sediment elevations in Columbia River datum subtract 5 ft from NAVD88 datum (e.g. -8.22 ft NAVD88 = -13.22 ft CRD).

**Calculated Recovery** 

Recovery Length/Penetration Depth:

#### **Sediment Core Log** Sheet 2 of 2 Tube Length (ft): 15.0 Project: Gasco Site Remedy - U.S. Moorings Location: Willamette River, Portland, OR Project #: 000029-02.25 Surface Water Elevation (NAVD88): 8.32 Penetration Depth (ft): 14.0 Client: NW Natural Water Depth (ft): 6.5 Field Recovery Length (ft): 14.1 Mudline Elevation (ft): 1.82 Collection Date: 10/28/2013 Process Date: 10/29/2013 E/LONG:7623184.525 Contractor: MSS N/LAT:706142.7648 Process Method: Cut tube Vessel: R/V Nancy Anne Horiz. Datum: NAD83 ORNH Vert. Datum: NAVD88 Sample Quality: Good Operator: Bill Jaworski Method/Tube ID: Vibracore/3.75" Logged By: EM **Sediment Description** Estimated In-situ Elevation (NAVD88) Recovered Depth (ft) Recovered Interval Substantia Sample Archives Product Present (N/Y) Samples and Descriptions are in Recovered Depths. Classification Scheme: USCS 1.82



#### **Sediment Core Log** Sheet 1 of 1 Tube Length (ft): 15.0 Location: Willamette River, Portland, OR Project: Gasco Site Remedy - U.S. Moorings Project #: 000029-02.25 Surface Water Elevation (NAVD88): 6.14 Penetration Depth (ft): 13.0 Client: NW Natural Water Depth (ft): 12.9 Field Recovery Length (ft): 9.2 Mudline Elevation (ft): -6.76 Collection Date: 10/28/2013 Process Date: 10/28/2013 E/LONG:7622847.881 Contractor: MSS N/LAT:706185.5075 Process Method: Cut tube Vessel: R/V Nancy Anne Horiz. Datum: NAD83 ORNH Vert. Datum: NAVD88 Sample Quality: Good Operator: Bill Jaworski Method/Tube ID: Vibracore/3.75" Logged By: EM, JMD **Sediment Description** Estimated In-situ Elevation (NAVD88) Recovered Depth (ft) Recovered Interval Substantia Sample Archives Product Present (X Y Samples and Descriptions are in Recovered Depths. Classification Scheme: USCS -6.76 -7.0 0-1 ft: SILT (ML). Moist, soft, grayish brown, 95% non-plastic fines, 5% fine sand. No C528AQ-0-1 odor. No sheen. Contains small organic fibers less than 0.5 inch. 1 ft: 4 large wood fragments up to 3"x2", reddish brown. 1-2 ft: 90% non-plastic fines, 10% fine sand. -8.0 2-3 ft: Firm. -9.0 C528AQ-1-4 3-4 ft: Low-plasticity fines. -10.0 4-5 ft: Contains organics (small twig 3 inches, wood fragments, small rootlets). -11.0 5-6 ft: 95% low-plasticity fines, 5% fine sand. -12.0 5.9 ft (71 inches): 0.75 inch black band. Slight HC-like odor. No sheen. C528AQ-4-8 6-7.7 ft: contains slight HC-like odor. No sheen. -13.0 -14.0 7.7-8.5 ft: Contains black mottling. No odor. No sheen. -15.0 8.5-9.3 ft: Low-medium plasticity fines. Contains black mottling. Slight HC-like odor. C528AQ-8-9.3 -16.0 End of Core @ 9.3 ft. -17.0 -18.0 -19.0 -20.0 -21.0 **ANCHOR** Notes: 1. Attempt 1 of 1. **Calculated Recovery** 2. For sediment elevations in Columbia River datum subtract 5 ft from NAVD88 datum (e.g. -8.22 QEA # ft NAVD88 = -13.22 ft CRD). Recovery Length/Penetration Depth: 720 Olive Way, Suite 1900 Seattle, WA 98101

206-287-9130

71%

### **Sediment Core Log** Sheet 1 of 1 GS-01AQ Tube Length (ft): 15.0 Location: Willamette River, Portland, OR Project: Gasco Site Remedy - U.S. Moorings Project #: 000029-02.25 Surface Water Elevation (NAVD88): NA Penetration Depth (ft): 3.5 Client: NW Natural Water Depth (ft): NA Field Recovery Length (ft): 1.7 Mudline Elevation (ft): -1.75 Collection Date: 11/1/2013 Process Date: 11/1/2013 E/LONG:7623005.756 Contractor: AQ N/LAT:706324.6172 Process Method: Cut tube Vessel: NA Horiz. Datum: NAD83 ORNH Vert. Datum: NAVD88 Sample Quality: Good Operator: John Renda, Jeff Payson Method/Tube ID: Piston Core/3" Logged By: JMD **Sediment Description** Recovered Depth (ft) In-situ Elevation (NAVD88) Recovered Interval stimated Substantia Sample Archives Product Present (X Y Samples and Descriptions are in Recovered Depths. Classification Scheme: USCS -1.75 -2.0 0-0.8 ft: Large cobble up to 10 inches No Sample 0.8-1.3 ft: POORLY GRADED SAND AND GRAVEL (SP/GP). 50% coarse sand, 50% coarse gravel. Sand color is red. -3.0 1.3 ft: 3 inch bed of SILT (ML). Wet, firm, dark gray. Slight H2S-like odor. No Sheen. GS-01AQ-1-1.65 1.5-2.5 ft: POORLY GRADED SAND (SP). Dark gray, 100% fine sand. Slight H2S-like -4.0 odor. No sheen. End of Core @ 2.5 ft. -5.0 -7.0 -8.0 -9.0 -10.0 -11.0 -12.0 -13.0 -14.0 -15.0 -16.0 & ANCHOR Notes: 1. Attempt 1 of 2. **Calculated Recovery**

QEA SEE 720 Olive Way, Suite 1900 Seattle, WA 98101 206-287-9130

2. For sediment elevations in Columbia River datum subtract 5 ft from NAVD88 datum (e.g. -8.22

ft NAVD88 = -13.22 ft CRD).

3. 10 inch cobble layer at sediment surface was removed to allow for coring

4. Penetration depth is 3.5 ft below removed cobble layer.

Recovery Length/Penetration Depth:

0-0.8': NA; 0.8-2.5': 100%; 2.5-3.5': 0%

#### **Sediment Core Log** Sheet 1 of 1 SDDA18AQ Location: Willamette River, Portland, OR Tube Length (ft): 15.0 Project: Gasco Site Remedy - U.S. Moorings Project #: 000029-02.25 Surface Water Elevation (NAVD88): 5.54 Penetration Depth (ft): 14.0 Client: NW Natural Water Depth (ft): 22.3 Field Recovery Length (ft): 12.5 Mudline Elevation (ft): -16.76 Collection Date: 10/28/2013 Process Date: 10/28/2013 Contractor: MSS N/LAT:706324.6172 E/LONG:7623005.756 Process Method: Cut tube Vessel: R/V Nancy Anne Horiz. Datum: NAD83 ORNH Vert. Datum: NAVD88 Sample Quality: Good Operator: Bill Jaworski Method/Tube ID: Vibracore/3.75" Logged By: EM, JMD **Sediment Description** Recovered Depth (ft) In-situ Elevation (NAVD88) Recovered Interval Substantia Product Present (N/Y) Samples and Descriptions are in Recovered Depths. Classification Scheme: USCS -16.76 -17.0 0-0.7 ft: SILT (ML). Soft, wet, dark gray, 95% non-plastic fines, 5% fine sand. No sheen. SDDA18AQ-0-1 No odor. 0.7-2.5 ft: Moist. -18.0 -19.0 SDDA18AQ-1-4 2.5-3.5 ft: SILT WITH SAND (ML). Soft, moist, dark gray, 85% non-plastic fines, 15% fine sand. Slight HC-like odor. No sheen. Contains pockets of SANDY SILT, 60% fines, 40% fine sand. -20.0 3.5-8.1 ft: SILT (ML). Moist, firm, dark gray, 95% low-plasticity fines, 5% fine sand. Contains black mottling and organics (wood fibers and rootlets) and pockets of SANDY -21.0 SILT. Slight HC-like odor. No sheen. 3.7 ft: 0.5 inch band of SILT, moist, firm, blackish gray. Slight HC-like odor. No sheen. 4.5 ft (54-55 inches): 1 inch band of SILT. Moist, firm, grayish black. Slight HC-like -22.0 4.6 ft: (55.5-56.5 inches): 1 inch band same as at 4.5 ft but color is darker. SDDA18AQ-4-8 5.8 ft: 0.5 inch band same as above at 3.7 ft. SDDA18AQ-54-55 SDDA18AQ-55-56 -23.0 (See Notes) 7.15 ft: 0.5 inch band same as above at 3.7 ft. -24.0 8.1-8.4 ft: No black mottling. -25.0 8.4-11 ft: SILTY SAND (SM). 80% fine sand, 20% non-plastic fines. Silt content decreases downcore. Slight HC-like odor. No sheen. Contains pockets of moist, firm, -26.0 9.5 ft: Pocket of organics (decomposed wood fibers). SDDA18AQ-8-12.35 -27.0 -28.0 11-12.35 ft: POORLY GRADED SAND (SP), 100% fine sand, No odor, No sheen, -29.0 End of Core @ 12.35 ft. -30.0 -31.0 $oldsymbol{\mathcal{R}}$ anchor Notes: 1. Attempt 1 of 1. **Calculated Recovery** 2. For sediment elevations in Columbia River datum subtract 5 ft from NAVD88 datum (e.g. -8.22 OEA 😂 ft NAVD88 = -13.22 ft CRD). Recovery Length/Penetration Depth: 720 Olive Way, Suite 1900 3. Sample archive from 4-8 ft. does not include two bands described @4.5' and 4.6'. These two Seattle, WA 98101 bands were archived individually (SDDA18AQ-54-55 and SDDA18AQ-55-56).

206-287-9130

89%

# ATTACHMENT 3 CHAIN-OF-CUSTODY RECORDS

chali	of Custody Record & Laboratory Analysis R		COC#																		
									Analyt	ical Para	meter	s						* >	AN OF	CH	OR
	Date: 10  29  13			TI			T	T		T		T				V	OF	A	u		
	Laboratory : ARI Project Name: Gasco Data Gaps			11						-			1 1				, QL	110			
	Project Number: 000029,02.25 Task 10D			11									1 1								
	Field Manager: Joy Dunay															~					
	Phone Number: 206.287.9130 Shipment Method: Hand Delivery																				
	CONTRACTOR (CONTRACTOR )		_	lers .																	
ine	Field Sample ID	Collection Date/Time	Matrix	No. of Containers	10°C Archino	יות בשונוווים											360		Comm	nents	
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2	20-BFAQ-8-12-131029	1 945	1	3		X															
3	20-BFAQ-12-13.15-13029	950		R	1	X															
4	50-BGAQ-0-1-131029	1110		2	5	0															
5	50-136AQ-1-4-131029	1115		3	)	X															
6	50-BGAQ-4-8-131029	1120		3		X															
7	50-86AQ-8-12-131029	1125		3		X															
8	50-B6AQ-8-12-131029DUP	1135		t		×															
9	50-86AQ-12-13,9-131029	1130	1	3	)	X															
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	email sample confirmation report to labdata@anchorqea.co	m *		•	•			4						_							
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	17																	A	,		
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	Will Even Mal	CZYK	10/30/1		-	57	4	11)	14	2	1	XX	Tit!	CV	M	1//	33	2 10/	30/13	18/5	7
	Signature/Printed Name	,		Date	e/Ti	me	Signatur	e/Printed N	Name								Y	Date/Time			
	Relinquished By:	Company	:				Received By: Company:														
																				1000	
	Signature/Printed Name			Date	e/Ti	me	Signatur	e/Printed N	Name									Date/Time			

COC#



### **CHAIN OF CUSTODY**

Lab# ART

COC of

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

Company: Aricho! QEA Project Mgr: Toxy							Lv	e L				Project Name:			Gas	10	Sec	liments			Proje	roject# ooco29					
Address: 925 News	1				N			/		ie: 7 o	4.90	5.5	320	3	Fax:				Emai	l:							
Sampled by: Jrss								ANALYSIS REQUEST																			
Site Location: OR WA Other: SAMPLE ID	LAB ID#	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 VOC	8260 RBDM VOCs	8260 BTEX	8270 SVOC	8270 SIM PAHS	8082 PCBs	OLL 009	RCRA Metals (8)	TCLP Metals (8)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Hg, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS TCLP	1200- COLS	1200-Z	4661VE-16F						
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0//					rinted Name: Tank Tim							ed Name:															
Company: Angeline DEA Company: A										7	Company:								iny:								

# ATTACHMENT 4 PHOTOGRAPHS

## ATTACHMENT 4: PHOTOGRAPHS 20-BFAQ



20-BFAQ (1 of 12)



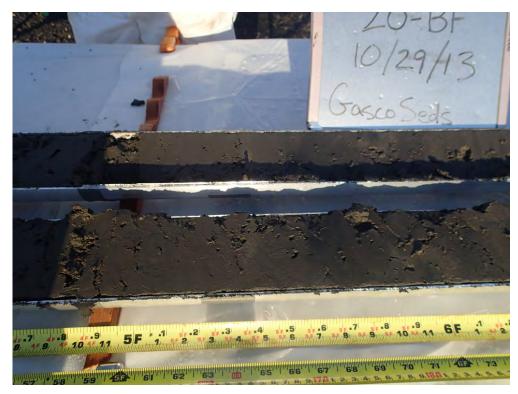
20-BFAQ (2 of 12)



20-BFAQ (3 of 12)



20-BFAQ (4 of 12)



20-BFAQ (5 of 12)



20-BFAQ (6 of 12)



20-BFAQ (7 of 12)



20-BFAQ (8 of 12)



20-BFAQ (9 of 12)



20-BFAQ (10 of 12)



20-BFAQ (11 of 12)



20-BFAQ (12 of 12)

#### 50-BGAQ



50-BGAQ (1 of 13)



50-BGAQ (2 of 13)



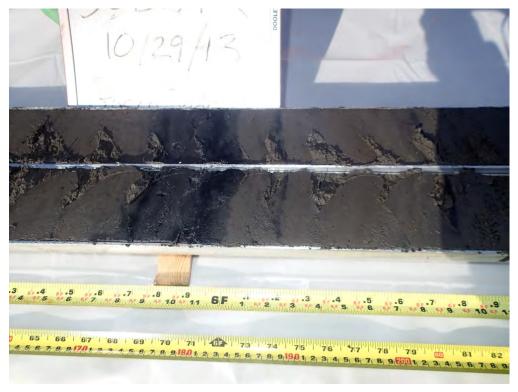
50-BGAQ (3 of 13)



50-BGAQ (4 of 13)



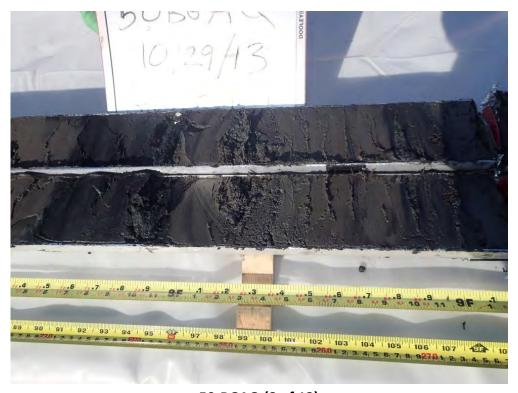
50-BGAQ (5 of 13)



50-BGAQ (6 of 13)



50-BGAQ (7 of 13)



50-BGAQ (8 of 13)



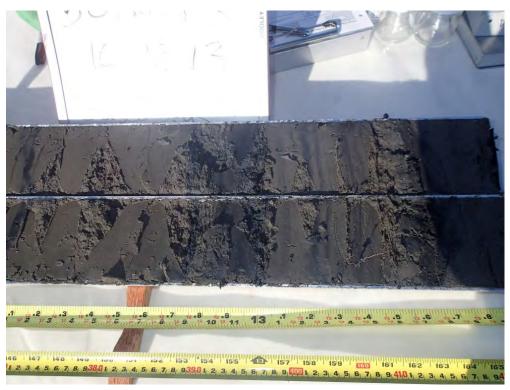
50-BGAQ (9 of 13)



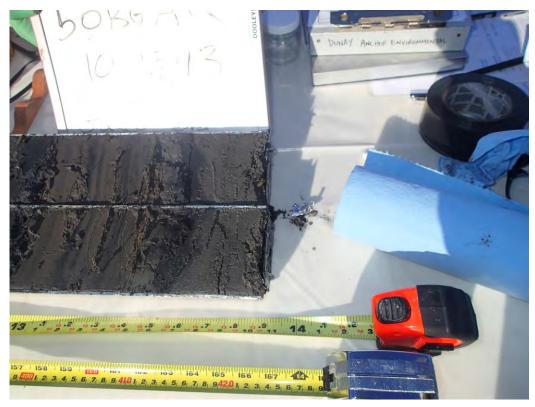
50-BGAQ (10 of 13)



50-BGAQ (11 of 13)

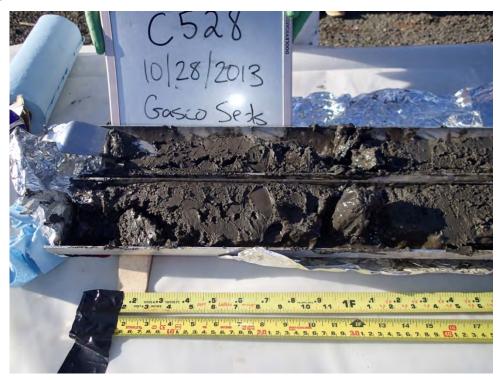


50-BGAQ (12 of 13)



50-BGAQ (13 of 13)

#### **C528AQ**



C528AQ (1 of 8)



C528AQ (2 of 8)



C528AQ (3 of 8)



C528AQ (4 of 8)



C528AQ (5 of 8)



C528AQ (6 of 8)



C528AQ (7 of 8)



C528AQ (8 of 8)

#### GS-01AQ



GS-01AQ (1 of 2)

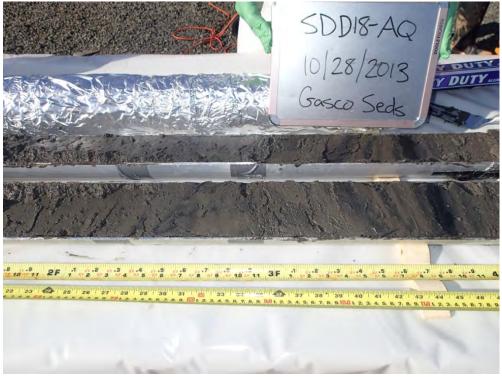


GS-01AQ (2 of 2)

#### SDDA18AQ



SDDA18AQ (1 of 7)



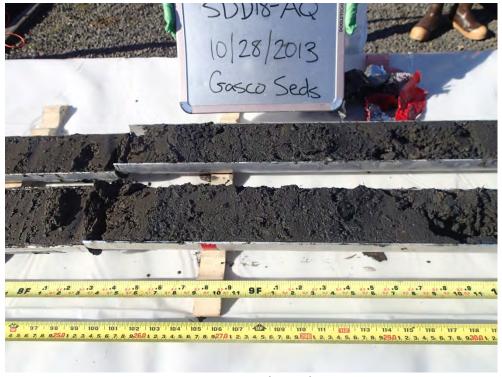
SDDA18AQ (2 of 7)



SDDA18AQ (3 of 7)



SDDA18AQ (4 of 7)



SDDA18AQ (5 of 7)



SDDA18AQ (6 of 7)



SDDA18AQ (7 of 7)